USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2004MO35B

Title: Experimental Analysis of Nutrient Uptake in Streams

Project Type: Research

Focus Categories: Nutrients, Water Quality, Nitrate Contamination

Keywords: nutrients; nitrogen, phosphorus, ecosystems, euthrophication

Start Date: 03/01/2004

End Date: 02/28/2005

Federal Funds Requested: $18,985

Non-Federal Matching Funds Requested: $44,638

Congressional District: 8th

Principal Investigator:
Dev Niyogi

Abstract

Anthropogenic loading of the nutrients nitrogen and phosphorus to natural ecosystems has led to the imperilment of ecosystem integrity and services. Nutrient uptake in streams can diminish the nutrient flux from agricultural landscapes to the fragile open-water systems (lakes, estuaries, and coastal areas) that are most sensitive to nutrient pollution. Although nutrient uptake in streams has received growing attention in recent years, we still have little quantitative information on the specific characteristics of streams that affect uptake rates. I propose to conduct research combining experimental (using artificial stream channels) and observational (measuring uptake in whole streams) approaches to understand the primary biological controls on nutrient uptake in streams. Specifically, this research will quantify the response of nutrient uptake to varying amounts of two key biotic features in streams: algal biomass and leaf litter. Experimental channels will be set up in natural streams where these biological characteristics can be manipulated. Results from the experimental channels will allow predictions of uptake rates for whole streams given their biological characteristics. These predictions will be tested by measuring uptake in a set of natural streams in the Ozark region. This project will foster the education of graduate and undergraduate students at UMR and help us understand and manage nutrient uptake in streams to protect downstream systems.